



**United States Department of the Interior**

**BUREAU OF LAND MANAGEMENT**

Utah State Office

P.O. Box 45155

Salt Lake City, UT 84145-0155

<http://www.blm.gov>



IN REPLY PLEASE REFER TO:

3452

East Mountain LMU (UTU-73336)  
(UT-923)

CERTIFIED MAIL – 7009-1410-0001-9070-3088

**APR 06 2010**

Interwest Mining Co.  
Subsidiary of PacifiCorp  
Scott M. Childs  
Manager, Lands and Regulatory Affairs  
1407 W. North Temple, Suite 310  
Salt Lake City, Utah 84116

The Bureau of Land Management (BLM) received "...modifications and clarifications to the R2P2 for the Deer Creek Mine..." from PacifiCorp through its subsidiaries, Interwest Mining company (Interwest) and Energy West Mining Company (Energy West) dated April 29, 2004 along with maps. These maps provided the projected timing for mining of certain longwall panels in the Deer Creek and Cottonwood Mines.

Additional correspondence from PacifiCorp includes;

- December 15, 2006 BLM received "PacifiCorp's Modification and Reconfiguration of the East Mountain Logical Mining Unit – Emery County, Utah (UTU-73336)."
- December 21, 2005 BLM received PacifiCorp's application to add the State Institutional Trust Lands (SITLA) Mill Fork tract to the LMU.
- April 2, 2010 BLM received: "Energy West Mining Company – East Mountain LMU -- Scanned Maps on Disk"

In the interim, BLM and PacifiCorp have continued to discuss the East Mountain Logical Mining Unit (LMU) and specific leases in light of Maximum Economic Recovery (MER) requirements (Title 43: Public Lands: Interior § 3482.2 (a)(2) Action on plans). During this time the PacifiCorp East Mountain coal production has been produced via the Deer Creek Mine from the SITLA Mill Fork coal lease.

BLM has now completed an assessment of the remaining recoverable reserves in the East Mountain LMU (UTU-73336). Attached are:

- Spreadsheets of the calculated remaining recoverable areas of coal reserves.
- Maps of labeled areas of remaining coal reserves in the Blind Canyon and Hiawatha coal seams.
- Description of the procedures used in calculating the remaining recoverable reserves for the Blind Canyon and Hiawatha coal seams.

**RECEIVED**


**APR 07 2010**

**DIV. OF OIL, GAS & MINING**

BLM recommends PacifiCorp reconsider the areas marked in blue on the maps for future mining (which were removed from the mining plan previously).

Because it is necessary to revise the East Mountain LMU (UTU-73336), a revised Resource Recovery and Protection Plan (R2P2) is needed (including projected timing of the mining). PacifiCorp is required to provide the necessary proposed R2P2 revision within 90 days of receipt of this letter. Any labeled red cross hatched areas, that PacifiCorp projects to be uneconomic in terms of MER at this time for mining must be specifically identified and numerically justified in economic terms. Also, PacifiCorp is welcome to recommend unlabeled areas that should be considered for coal energy recovery.

If you have questions please call Jeff McKenzie at (801) 539-4086 or Steve Rigby at (435) 636-3604.

  
for Roger L. Bankert  
Chief, Branch of Minerals

cc:

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Energy Policy Coordinator  
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Corporation of the Presiding Bishop of  
The Church of Jesus Christ of Latter-day Saints  
c/o Natural Resources Section  
50 East North Temple, 12<sup>th</sup> Floor  
Salt Lake City, Utah 84150-0001

BLM Price Field Office (Attn: Steve Rigby)

**TABLE 1. East Mountain projected recoverable tonnage - Blind Canyon seam**

DATE: 3/23/2010

Label	Area (square feet)	Height (feet)	Volume (cubic feet)	lbs <sup>1</sup> (lbs)	In place Tonnage (tons)	Mining Height (feet)	CONTINUOUS MINER			LONGWALL		
							First Mining 40% (tons)	Room & Pillar 50% (tons)	Development (20%) 40% (tons)	Longwall (80%) 90% (tons)	Total LONGWALL (tons)	
DCM BC 001	4,417,000	6.0	26,502,000	2,173,164,000	1,086,582	6.0		543,291				
DCM BC 002	1,379,000	6.0	8,274,000	678,468,000	339,234	6.0		169,617				
DCM BC 003	5,254,000	6.0	31,524,000	2,584,968,000	1,292,484	6.0		646,242				
DCM BC 004 <sup>3</sup>	7,173,000	9.0	64,557,000	5,293,674,000	2,646,837	8.0		1,176,372				
DCM BC 005	4,350,000	12.0	52,200,000	4,280,400,000	2,140,200	11.0			156,948	1,412,532	1,569,480	
DCM BC 006	2,950,000	7.0	20,650,000	1,693,300,000	846,650	6.5		393,088				
DCM BC 007	5,501,000	8.0	44,008,000	3,608,656,000	1,804,328	7.5		845,779				
DCM BC 008	2,513,000	9.0	22,617,000	1,854,594,000	927,297	8.0		412,132				
DCM BC 009	9,083,000	8.0	72,664,000	5,958,448,000	2,979,224	7.5		1,396,511				
DCM BC 010	4,435,000	11.0	48,785,000	4,000,370,000	2,000,185	10.0		909,175				
DCM BC 011	2,504,000	11.0	27,544,000	2,258,608,000	1,129,304	10.0		513,320				
DCM BC 012 <sup>2</sup>								125,000				
DCM BC 015	426,000	12.0	5,112,000	419,184,000	209,592	11.0	76,850					
DCM BC 016	2,498,000	8.0	19,984,000	1,638,688,000	819,344	7.5	307,254					
DCM BC 017	689,000	17.0	11,713,000	960,466,000	480,233	16.0	180,794					
DCM BC 018	1,164,000	10.0	11,640,000	954,480,000	477,240	9.0	171,806					
<b>TOTAL</b>							<b>736,704</b>	<b>7,130,527</b>			<b>1,569,480</b>	
							<b>TOTAL Blind Canyon</b>			<b>9,436,711 tons</b>		

NOTE 1: Calculations are based on a coal density of 82 lb/cubic foot.

NOTE 2: DCM BC 012 is block 2 and 1/2 south. The tonnage for block 2 and 1/2 south (125,000 tons) was derived from attachment Bureau of Land Management Moab District STAFF REPORT page 5.

NOTE 3: The area cross-hatched in green is an area of low coal that is not included in the remaining recoverable reserves (based on most recent the geologic interpretation of November 2006).

Density

82 lb/cubic foot



**TABLE 2. East Mountain projected tonnage reserves for the Hiawatha seam.**

DATE: 3/23/2010

Label	Area (square feet)	Height (feet)	Volume (cubic feet)	lbs <sup>1</sup> (lbs)	In place Tonnage (tons)	Mining Height (feet)	CONTINUOUS MINER			LONGWALL		
							First Mining 40% (tons)	Room & Pillar 50% (tons)	Development (20%) 40% (tons)	Longwall (80%) 90% (tons)	Total LONGWALL (tons)	
DCM HW_001	2,343,000	8.0	18,744,000	1,537,008,000	768,504	7.5		360,236				
DCM HW_002	38,007,000	8.0	304,056,000	24,932,592,000	12,466,296	7.5		5,843,576				
DCM HW_003	20,000,000	12.0	240,000,000	19,680,000,000	9,840,000	11.0			721,600	6,494,400	7,216,000	
DCM HW_004	6,200,000	10.0	62,000,000	5,084,000,000	2,542,000	9.0		1,143,900				
DCM HW_005	2,649,000	9.0	23,841,000	1,954,962,000	977,481	8.0			69,510	625,588	695,098	
DCM HW_006	2,732,000	8.0	21,856,000	1,792,192,000	896,096	7.5			67,207	604,865	672,072	
DCM HW_007	851,000	7.0	5,957,000	488,474,000	244,237	6.5		113,396				
DCM HW_009 <sup>2</sup>	4,913,000	7.0				6.5		243,439				
DCM HW_015	2,732,000	14.0	38,248,000	3,136,336,000	1,568,168	13.0		728,078				
DCM HW_016	7,354,000	11.0	80,894,000	6,633,308,000	3,316,654	10.0	1,206,056					
<b>TOTAL</b>							<b>1,206,056</b>	<b>8,432,626</b>			<b>8,583,170</b>	
									<b>TOTAL Hiawatha</b>	<b>18,221,851 tons</b>		

NOTE 1: Calculations are based on a coal density of 82 lb/cubic foot.

NOTE 2: Area DCM\_HW\_009 was previously mined by first mining extracting approximately 411,218 tons. The average pillar width was 77.5 feet (n=30). The in-place tonnage before mining was approximately 1,309,315 tons. The remaining pillars contain approximately 243,439 recoverable tons. The calculations are attached as Table 3  
Projected tonnage of area DCM\_HW\_009.

Density

82 lb/cubic foot

## DATE: 3/23/2010

<b>TOTAL</b>	<b>27,658,562</b>	<b>short tons</b>
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Projected Market Value <sup>4</sup>	\$	1,102,193,697
Royalty at 8% of \$39.85 per short ton <sup>4</sup>	\$	88,175,496
Royalty to Federal (1/2 distribution)	\$	44,087,748
Royalty to the State of Utah (1/2 distribution)	\$	44,087,748

NOTE 2: Area DCM\_HW\_009 was previously mined by first mining extracting approximately 411,218 tons. The average pillar width was 77.5 feet (n=30). The in-place tonnage before mining was approximately 1,309,315 tons. The remaining pillars contain approximately 243,439 recoverable tons. The calculations are attached as Table 3 Protected tonnage of area DCM\_HW\_009.

NOTE 4: \$39.85/short ton from "SNL Energy COAL REPORT" March 29, 2010 page 35 "Physical Market" table

**NOTE 5:** If the Sea Gull Mine workings cannot be accessed, the remaining recoverable tonnage could be reduced by some 162,000 tons.

NOTE 6:  
The area cross-hatched in green is an area of low coal that is not included in the remaining recoverable reserves (based on most recent the geologic interpretation of November 2006).



**TABLE 3. PROJECTED TONNAGE OF AREA DCM\_HW\_009**

DATE: 03/23/2010

Pillar width measurements (feet) <sup>2</sup>
73
79
76
79
82
73
76
82
79
76
79
77
79
79
78
72
76
80
77
77
89
65
76
80
80
82
81
75
71
78

PILLAR WIDTH ANALYSIS	
Mean	77.533
Standard Error	0.777
Median	78
Mode	79
Standard Deviation	4.257
Sample Variance	18.120
Range	24
Minimum	65
Maximum	89
Sum	2326
Count	30

TONNAGE OF ONE PILLAR	
Width	77.5 ft
Area	6006 square ft
Height	7 ft
Volume	42044 cubic ft
Density	82 lb/cubic foot
lbs	3447588 lbs
Tons per Pillar <sup>1</sup>	1724 tons/pillar

AREA DCM_HW_009 PROJECTED TONNAGE		
	4 pillar wide drift	5 pillar wide drift
Length of west drift <sup>2</sup>	3294	1270
Length of east drift <sup>2</sup>	4592	2713
Total length	7886	3983
Number of rows of west drift	33	13
Number of rows of east drift	46	28
Total rows	79	41
Total number of pillars	316	205
Total number of pillars	521 pillars	
Tons per pillar	1724 tons/pillar	
Tonnage of all pillars	898,097 tons	
Area DCM_HW_009	4,913,000 square feet	
Mining height	6.5 ft	
In-place tonnage before mining	1,309,315 tons	
50% of In-place tonnage (R&P)	654,657 tons	
Tonnage of rooms (mined out)	411,218 tons	
<b>Projected Tonnage HW_009</b>	<b>243,439 tons</b>	

Note 1: Calculations are based on a coal density of 82 lb/cubic foot.

Note 2: A map of the pillar width and drift length is attached.

# East Mountain REMOVED projected tonnage reserves

DATE: 3/23/2010

Label	Area (square feet)	Height (feet)	Volume (cubic feet)	lbs <sup>3</sup> (lbs)	In place Tonnage (tons)	Mining Height (feet)	CONTINUOUS MINER			LONGWALL		
							First Mining 40% (tons)	Room & Pillar 50% (tons)	Development (20%) 40% (tons)	Longwall (80%) 90% (tons)	Total LONGWALL (tons)	
DCM BC_013	19,524,000	7.0	136,668,000	11,206,776,000	5,603,388	6.5						
DCM BC_014	28,228,000	9.0	254,052,000	20,832,264,000	10,416,132	8.0			416,252	3,746,265	4,162,517	
DCM BC_019	29,143,000	7.0	204,001,000	16,728,082,000	8,364,041	6.5	3,106,644		740,703	6,666,324	7,407,027	
							BC Subtotal					
DCM HW_008	1,941,000	12.0	23,292,000	1,909,944,000	954,972	11.0			1,156,954	10,412,590	11,569,544	
DCM HW_010	10,394,000	6.0	62,364,000	5,113,848,000	2,556,924	6.0		1,278,462	70,031	630,282	700,313	
DCM HW_011	51,188,000	7.0	358,316,000	29,381,912,000	14,690,956	6.5		6,820,801				
DCM HW_012	3,097,000	7.0	21,679,000	1,777,678,000	888,839	6.5		412,675				
DCM HW_013	2,386,000	6.0	14,316,000	1,173,912,000	586,956	6.0		293,478				
DCM HW_014	1,657,000	7.0	11,599,000	951,118,000	475,559	6.5	176,636					
							HW Subtotal		70,031	630,282	700,313	
							CM Subtotals					
							3,283,280	8,805,416		LW Subtotal	12,269,857	

Blind Canyon Tonnage 14,676,188  
Hiawatha Tonnage 9,682,365

**Total removed tonnage 24,358,553 short tons**

Projected Market Value<sup>4</sup> \$ 970,688,339  
Royalty at 8% of \$39.85 per short ton<sup>4</sup> \$ 77,655,067

Royalty to Federal (1/2 distribution) \$ 38,827,534

Royalty to the State of Utah (1/2 distribution) \$ 38,827,534

NOTE 1: DCM\_BC\_012 is block 2 1/2 south. The tonnage for block 2 1/2 south (125,000 tons) from Bureau of Land Management Moab District STAFF REPORT page 5.

NOTE 2: Area DCM\_HW\_009 was previously mined by first mining extracting approximately 411,218 tons. The average pillar width was 77.5 feet (n=30). The in-place tonnage before mining was approximately 1,309,315 tons. The remaining pillars contain approximately 243,439 recoverable tons. The calculations are attached as Table 3  
Projected tonnage of area DCM\_HW\_009.

NOTE 3: Density 82 lb/cubic foot

NOTE 4: \$39.85/ short ton from "SNL Energy COAL REPORT" April 5, 2010 page 33 "Physical Market" table

# BLM Assessment

of the

## East Mountain

### BLIND CANYON SEAM

### Recoverable Reserves

as of

April 6, 2010

#### **SUMMARY**

The projected remaining recoverable reserves for the Blind Canyon seam at East Mountain are 9.4 million tons of coal. The projected remaining recoverable reserves are categorized by three different mining methods; first mining, room and pillar mining, and longwall mining. The projected tonnage reserves for first mining, room and pillar mining, and longwall mining are 736,704 tons, 7,130,527 tons, and 1,569,480 tons respectively.

An area that has been removed from the approved mining plan is shown in blue on the southwest side of the coal reserve and contains a projected 14.6 million tons of recoverable coal in the Blind Canyon Seam as detailed in the fifth page of the spreadsheets. This area was projected to be minable in the "Evaluation of the East Mountain Study Area Emery County, Utah" by Behre Dolbear & Company, Inc. of Denver, Colorado. The Blind canyon and Hiawatha tonnage total 24.3 million tons for the area previously removed from the mine plan.

#### **PROCEDURE**

The projected tonnage reserves for the Blind Canyon seam were derived from the map DEER CREEK MINE, LIFE OF MINE PLAN/5 YEAR INCREMENTS, BLIND CANYON COAL SEAM of April 30, 2004. The map was provided to the Bureau of Land Management (BLM) by ENERGY WEST MINING COMPANY. The map was stamped by a professional engineer, John Christensen. The map was scanned as a jpeg file and then imported into Autodesk Map 3D 2007. The map was scaled to size according to the provided scale of 1-inch is equal to 1000-feet.

Areas of interest were outlined and hatched in red and then given a label. Two or more adjacent areas of interest were grouped as a location. The total number of locations of the Blind Canyon seam was six and the total number of areas of interest was eighteen. When outlining areas of interest, a distance of 200-feet was given between the closest previously mined out longwall panel development entries and



the closest area of interest. A distance of 200-feet was given between an outcrop and the closest area of interest. A distance of 100-feet was given between a fault and the closest area of interest when considering room and pillar mining or longwall mining. A distance of 50-feet was given between the outer extent of Deer Creek Mine lease boundaries and the closest area of interest. Maps of the six locations are attached. The maximum minable coal thickness used was 12 feet and the minimum was 5 feet.

In Location 4 there is an area of low coal that is not included in the remaining recoverable reserves. This area is cross-hatched in green which is based on the most recent geologic interpretation dated November 2006.

The approach for two areas was based on the work of others:

1. Location 5 contains is a unique area of interest referred to as 2 ½ south block. The area of 2 ½ south block was not measured again for this evaluation. A tonnage of 125,000 tons was projected previously for 2 ½ south block. The projected tonnage for 2 ½ south block was taken from the Bureau of Land Management STAFF REPORT page 5 dated August 26, 1987 and a copy of the report is attached.
2. Location 6 consists of a series of longwall panels. The dimensions of the longwall panels were taken from the mine plan map by the Behre Dolbear & Company, Inc. of Denver Colorado (Behre Dolbear). The longwall panels in the Behre Dolbear mine plan extended beyond the Deer Creek Mine permit boundary and therefore the longwall panels in the Blind Canyon seam were truncated at the west boundary. A map of the Behre Dolbear mine plan is attached.

The area in square feet was calculated from the command "LIST" in Autodesk Map 3D. The seam height in feet was determined from the East Mountain LMU UTU73336 Modification and Reconfiguration report. The volume was then calculated using equation 1.

$$(\text{Area}) \times (\text{Height}) = \text{Volume} \quad (\text{Eq. 1})$$

The coal density was assumed to be 82 pounds per cubic foot. The mass in pounds was calculated using equation 2.

$$(\text{Volume}) \times (\text{Density}) / 2000 = \text{tons} \quad (\text{Eq. 2})$$

The in-place tonnage was calculated using the conversion factor of 2000-lbs is equal to 1-ton. A roof/floor coal thickness factor was subtracted from the total coal thickness to arrive a mining height as follows:

Total Coal Seam Height (feet)	Coal Thickness Subtracted (feet)
> 8	1.0
8	0.5
7	0.5
< 7	0.0

The mining height was calculated by the difference between the seam height and the height allowed for dilution.

The recovery percentage used for first mining was 40% (no subsidence mining). The recovery percentage used for room and pillar mining was 50%. The tonnage for 40% first mining was calculated using equation 3. The tonnage for room and pillar mining was calculated using equation 4.

$$(\text{Area}) \times (\text{Mining Height}) \times (\text{Density}) \times (1 \text{ ton}/2000 \text{ lbs}) \times (0.4) = \text{First Mining Tonnage} \quad (\text{Eq. 3})$$

$$(\text{Area}) \times (\text{Mining Height}) \times (\text{Density}) \times (1 \text{ ton}/2000 \text{ lbs}) \times (0.5) = \text{Room and Pillar Tonnage} \quad (\text{Eq. 4})$$

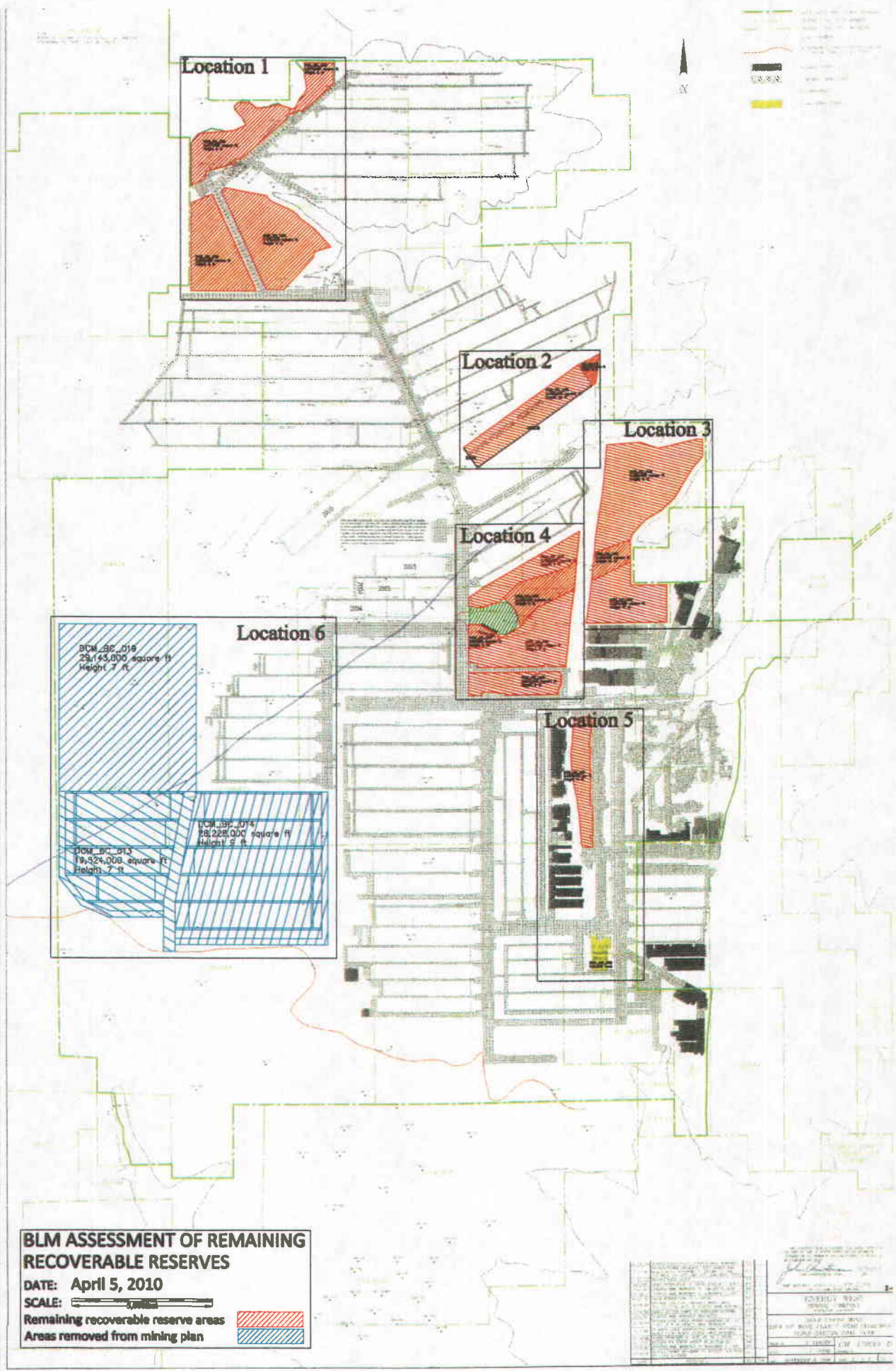
First mining was applied under the power line corridor. Detail of the extraction areas and percentages used is included in the attached spreadsheet and illustrated in the enclosed location maps.

The longwall mining calculation is split into two columns, development and longwall. An assumed 20% of the in-place coal was calculated as development and the remaining 80% was calculated as longwall mining. The recovery percentage used for development was 40%. The recovery percentage used for longwall mining was reduced by 90% to allow for seam undulations. The development tonnage and the longwall tonnage were calculated using equation 5 and equation 6 respectively.

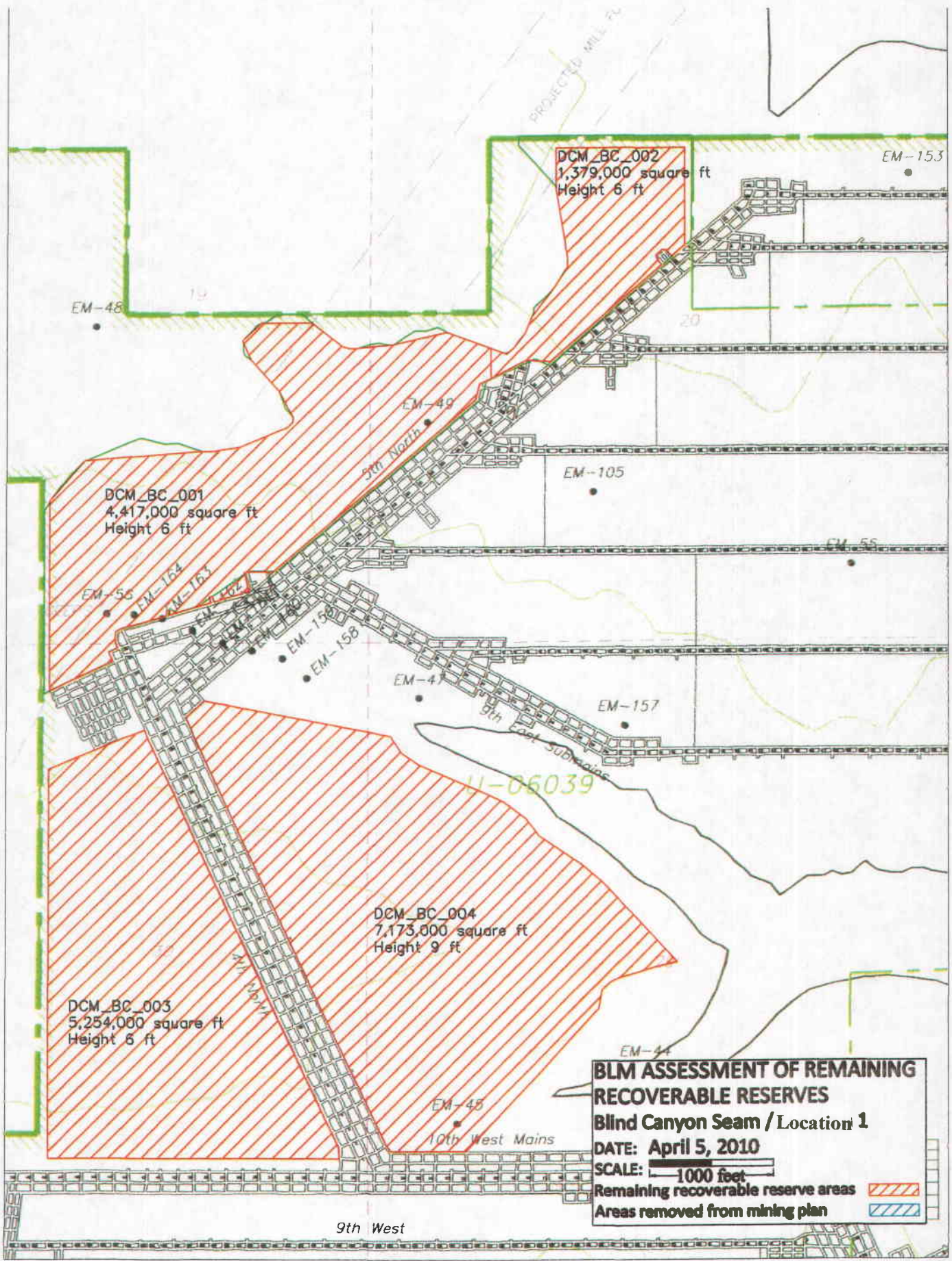
$$(\text{Area}) \times (\text{Mining Height}) \times (\text{Density}) \times (1 \text{ ton}/2000 \text{ lbs}) \times (0.2) \times (0.4) = \text{Development Tonnage} \quad (\text{Eq. 5})$$

$$(\text{Area}) \times (\text{Mining Height}) \times (\text{Density}) \times (1 \text{ ton}/2000 \text{ lbs}) \times (0.8) \times (0.9) = \text{Longwall Tonnage} \quad (\text{Eq. 6})$$

A spread sheet of all calculations is attached and includes the tonnages by location and by lease.









DCM\_BC\_002  
1,379,000 square ft  
Height 6 ft

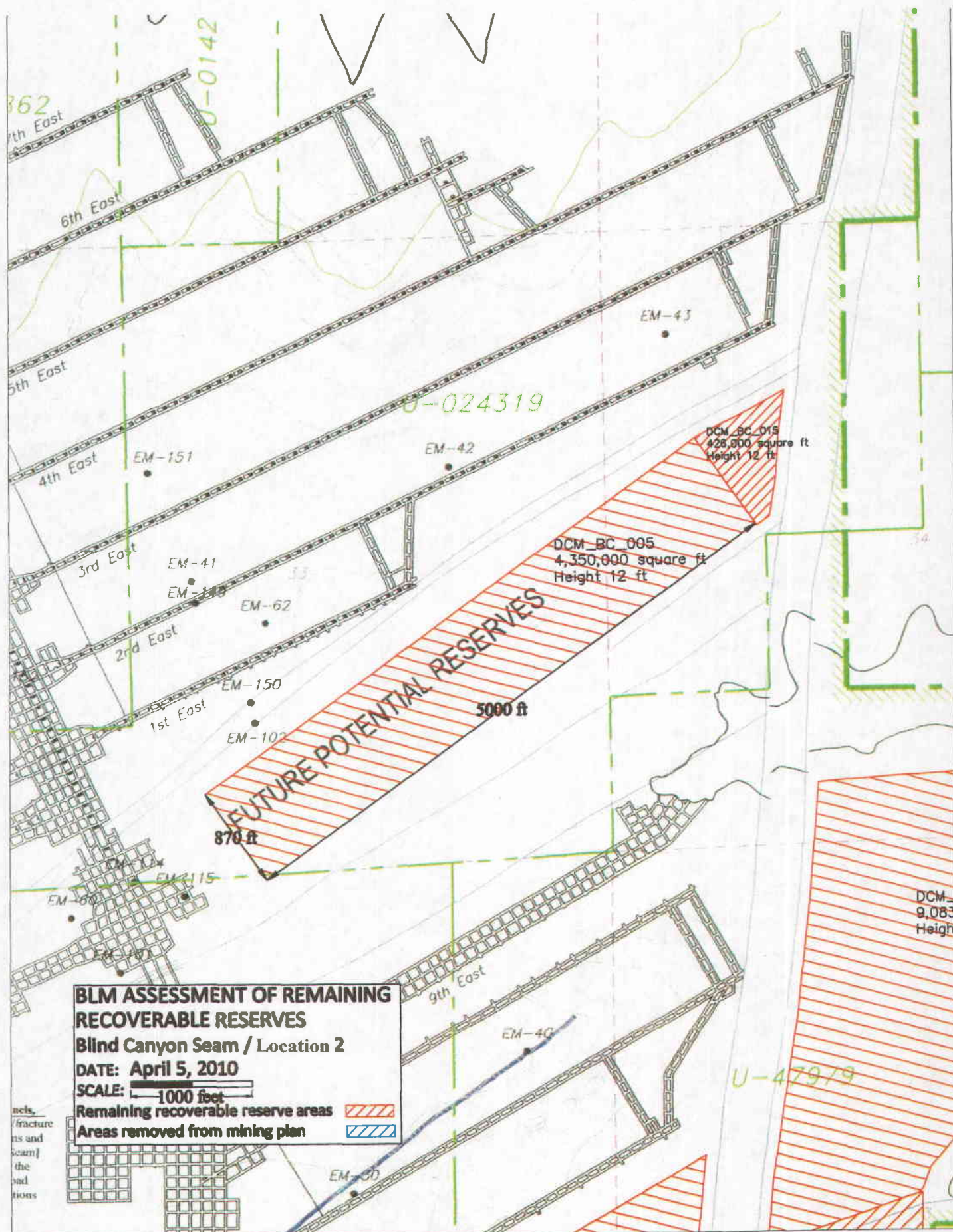
DCM\_BC\_001  
4,417,000 square ft  
Height 6 ft

DCM\_BC\_003  
5,254,000 square ft  
Height 6 ft

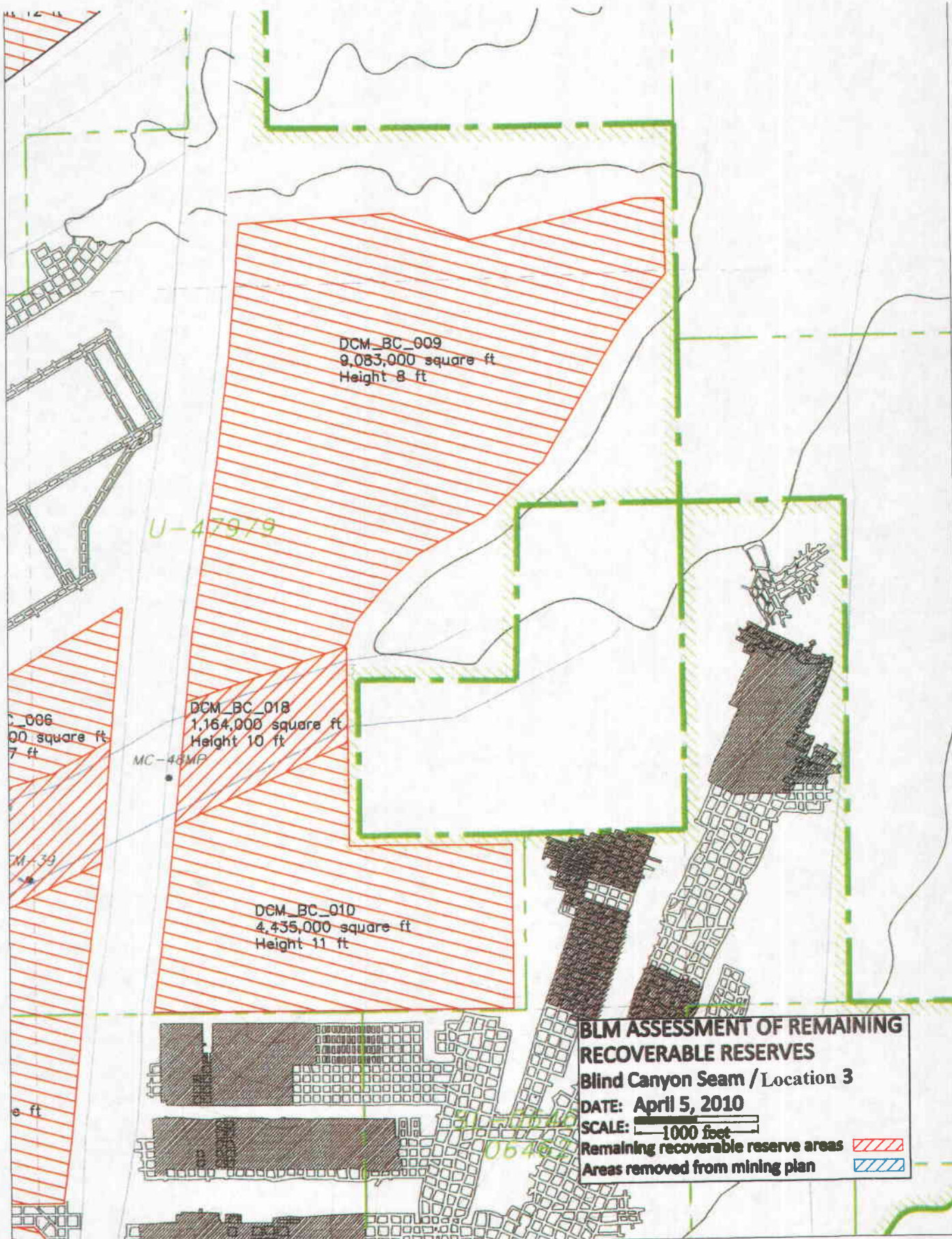
DCM\_BC\_004  
7,173,000 square ft  
Height 9 ft

**BLM ASSESSMENT OF REMAINING  
RECOVERABLE RESERVES**  
**Blind Canyon Seam / Location 1**  
**DATE: April 5, 2010**  
**SCALE: 1000 feet**  
Remaining recoverable reserve areas   
Areas removed from mining plan 

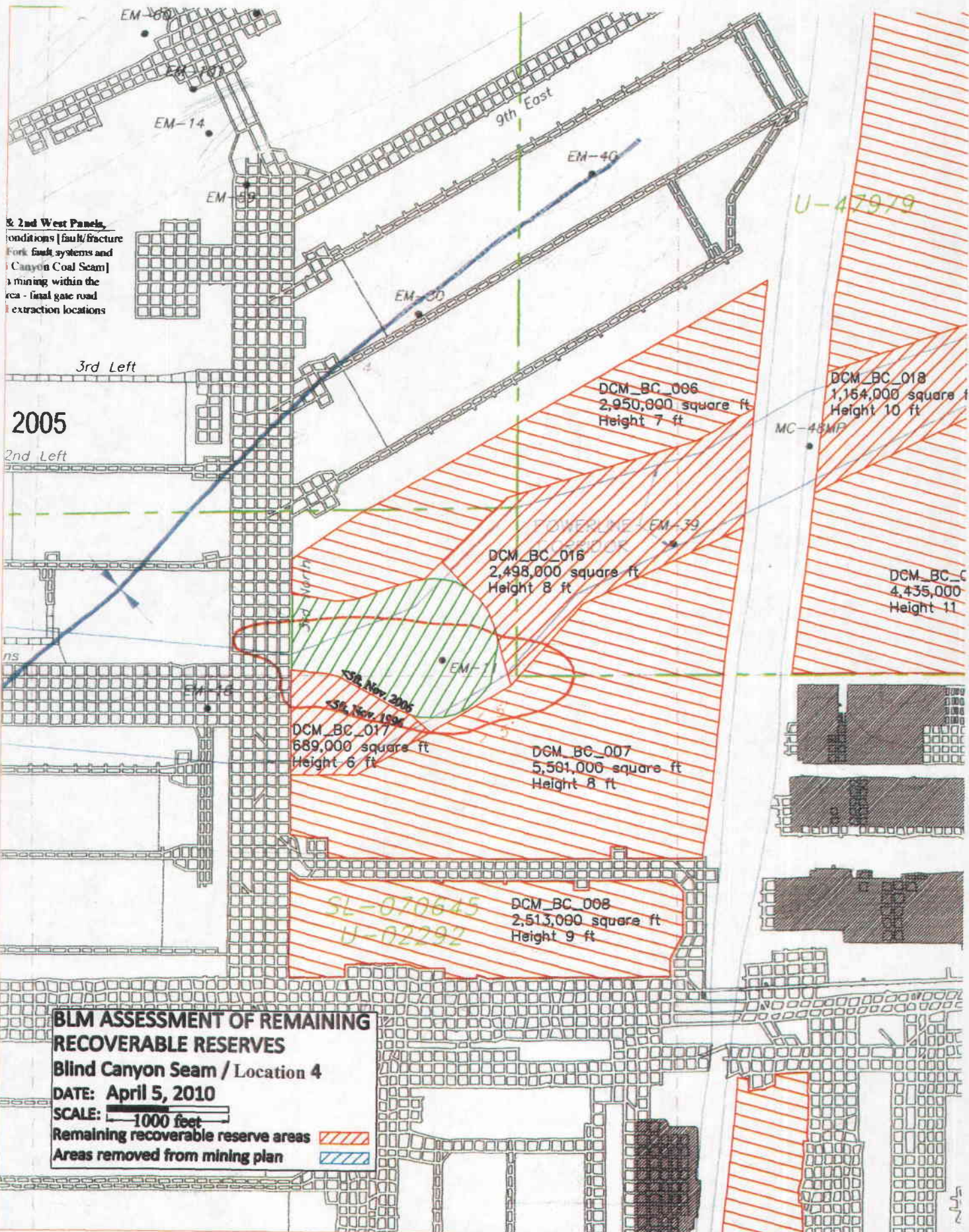




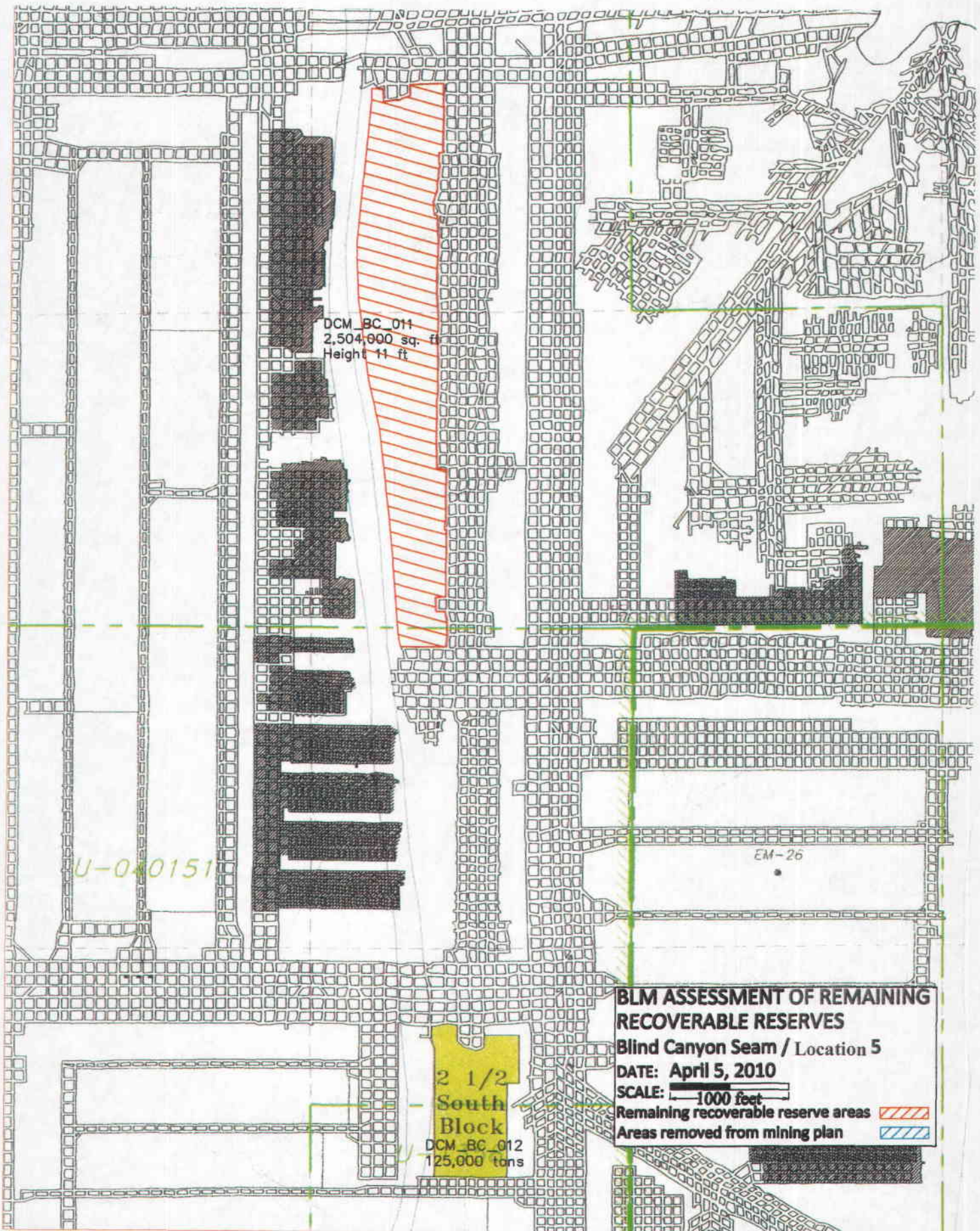












DCM\_BC\_011  
2,504,000 sq. ft.  
Height 11 ft

U-040151

EM-26

2 1/2  
South  
Block  
DCM\_BC\_012  
125,000 tons

### BLM ASSESSMENT OF REMAINING RECOVERABLE RESERVES

Blind Canyon Seam / Location 5

DATE: April 5, 2010

SCALE: 1000 feet

Remaining recoverable reserve areas

Areas removed from mining plan





EM-19

EM-108

EM-10

2004

DCM\_BC\_019  
29,143,000 square ft  
Height 7 ft

EM-4

EM-20

EM-37

EM-78

EM-29

EM-9

EM-33

EM-36

U-084924

U-084923

EM-15

EM-21

DCM\_BC\_013  
19,524,000 square ft  
Height 7 ft

DCM\_BC\_014  
28,228,000 square ft  
Height 9 ft

EM-5

EM-22



EM-32

EM-29

EM-1

EM-23C

U-083066

BLM ASSESSMENT OF REMAINING  
RECOVERABLE RESERVES  
Blind Canyon Seam / Location 6  
DATE: April 5, 2010  
SCALE: 1000 feet  
Remaining recoverable reserve areas   
Areas removed from mining plan 



# BLM Assessment

of the

## East Mountain

### HIAWATHA SEAM

### Recoverable Reserves

as of

April 2, 2010

#### **SUMMARY**

The total projected remaining recoverable reserves for the Hiawatha seam at East Mountain are approximately 18.2 million tons of coal. The total remaining recoverable reserves are categorized by three different mining methods; first mining, room and pillar mining, and longwall mining. The projected tonnage reserves for first mining, room and pillar mining, and longwall mining are 1,206,056-tons, 8,432,626-tons, and 8,583,070-tons respectively.

Areas that have been removed from the approved mining plan is shown in blue on the southwest side and east side of the coal reserve and contain a projected 9.6 million tons of recoverable coal in the Hiawatha seam as detailed in the fifth page of the spreadsheets. This area was projected to be minable in the "Evaluation of the East Mountain Study Area Emery County, Utah" by Behre Dolbear & Company, Inc. of Denver, Colorado. The Blind canyon and Hiawatha tonnage total 24.3 million tons for the area previously removed from the mine plan. Other smaller areas removed from the mine plan are also shown in blue but are in addition to the above total for the Hiawatha Seam (DCM\_HW\_004 and DCM\_HW\_016).

#### **PROCEDURE**

The projected tonnage reserves for the Hiawatha seam were derived from the map DEER CREEK MINE, LIFE OF MINE PLAN/5 YEAR INCREMENTS, BLIND CANYON COAL SEAM of April 30, 2004. The map was provided to the Bureau of Land Management (BLM) by ENERGY WEST MINING COMPANY. The map was stamped by a professional engineer, John Christensen. The map was scanned as a jpeg file and then imported into Autodesk Map 3D 2007. The map was scaled to size according to the provided scale of 1-inch is equal to 1000-feet.

Areas of interest were outlined and hatched in red and then given a label. Two or more adjacent areas of interest were grouped as a location. The total number of locations of the Hiawatha seam was three and the total number of areas of interest was sixteen. When outlining areas of interest, a distance of 200-feet was given between the closest previously mined out longwall panel development entries and the closest area of interest. A distance of 200-feet was given between an outcrop and the closest area of interest. A distance of 100-feet was given between a fault and the closest area of interest when considering room and pillar mining or longwall mining. A distance of 50-feet was given between the outer extent of Deer Creek Mine lease boundaries and the closest area of interest. Maps of the three locations are attached. The maximum minable coal thickness used was 12 feet and the minimum was 5 feet.

Location three contains an area of interest labeled DCM\_HW\_009. The area DCM\_HW\_009 was previously mined by first mining. The in-place tons before mining were approximately 1,309,315-tons. Approximately 411,218 tons of coal were previously mined out. Approximately 234,439-recoverable-tons remain to be mined by room and pillar mining methods. The procedure for calculating the projected tons for area DCM\_HW\_009 are attached.

The area in square feet was calculated from the command "LIST" in Autodesk Map 3D. The seam height in feet was determined from the East Mountain LMU UTU73336 Modification and Reconfiguration report. The volume was then calculated using equation 1.

$$(\text{Area}) \times (\text{Height}) = \text{Volume} \quad (\text{Eq. 1})$$

The coal density was assumed to be 82 pounds per cubic foot. The mass in pounds was calculated using equation 2.

$$(\text{Volume}) \times (\text{Density}) / 2000 = \text{tons} \quad (\text{Eq. 2})$$

The in-place tonnage was calculated using the conversion factor of 2000-lbs is equal to 1-ton. A roof/floor coal thickness factor was subtracted from the total coal thickness to arrive a mining height as follows:

Total Coal Seam Height (feet)	Coal Thickness Subtracted (feet)
> 8	1.0
8	0.5
7	0.5
< 7	0.0

The mining height was calculated by the difference between the seam height and the height allowed for dilution.

The recovery percentage used for first mining was 40% (no subsidence mining). The recovery percentage used for room and pillar mining was 50%. The tonnage for 40% first mining was calculated using equation 3. The tonnage for room and pillar mining was calculated using equation 4.

$$(\text{Area}) \times (\text{Mining Height}) \times (\text{Density}) \times (1 \text{ ton}/2000 \text{ lbs}) \times (0.4) = \text{First Mining Tonnage} \quad (\text{Eq. 3})$$

$$(\text{Area}) \times (\text{Mining Height}) \times (\text{Density}) \times (1 \text{ ton}/2000 \text{ lbs}) \times (0.5) = \text{Room and Pillar Tonnage} \quad (\text{Eq. 4})$$

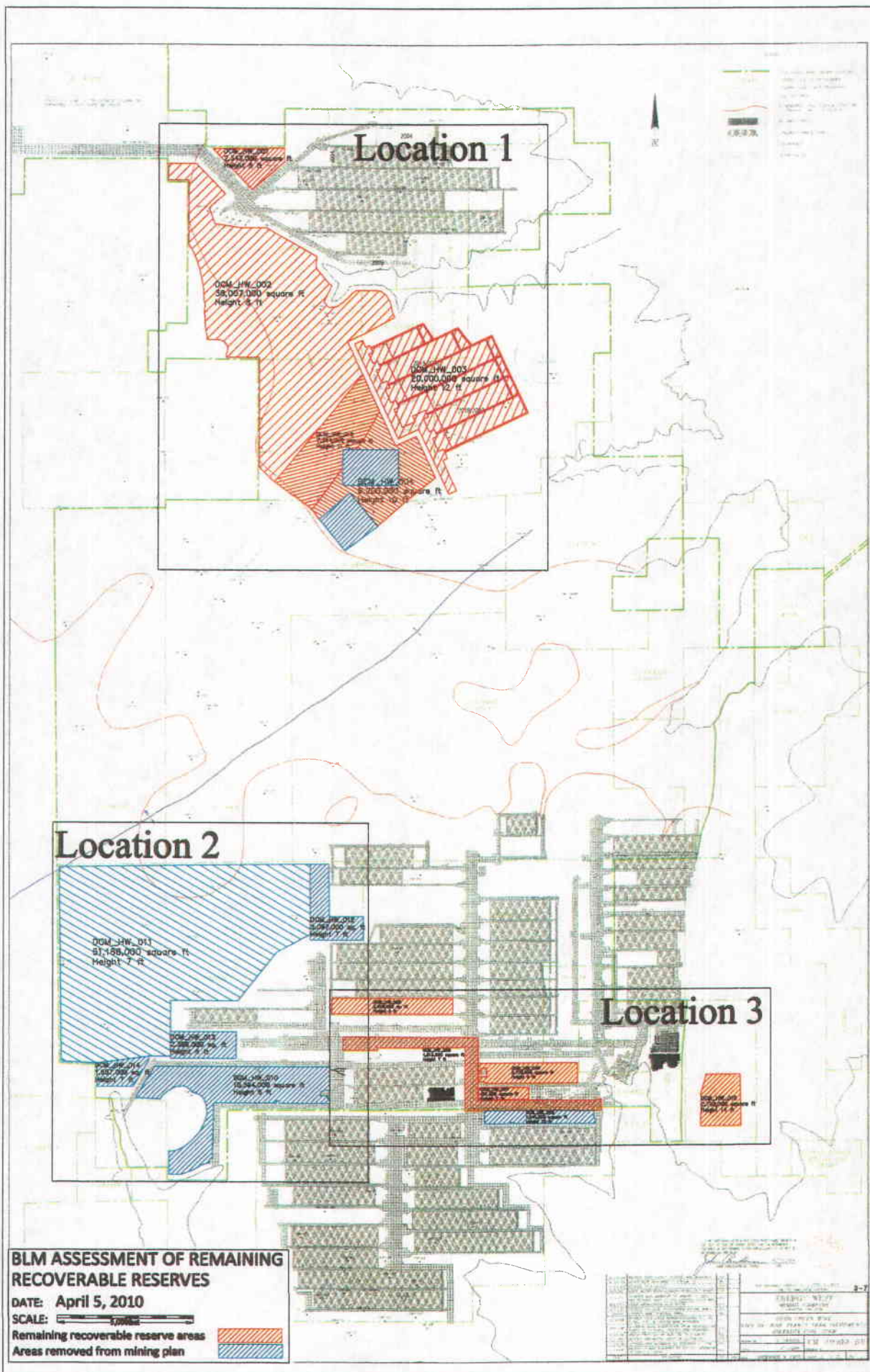
The longwall mining calculation is split into two columns, development and longwall. An assumed 20% of the in-place coal was calculated as development and the remaining 80% was calculated as longwall mining. The recovery percentage used for development was 40%. The recovery percentage used for longwall mining was reduced by 90% to allow for seam undulations. The development tonnage and the longwall tonnage were calculated using equation 5 and equation 6 respectively.

$$(\text{Area}) \times (\text{Mining Height}) \times (\text{Density}) \times (1 \text{ ton}/2000 \text{ lbs}) \times (0.2) \times (0.4) = \text{Development Tonnage} \quad (\text{Eq. 5})$$

$$(\text{Area}) \times (\text{Mining Height}) \times (\text{Density}) \times (1 \text{ ton}/2000 \text{ lbs}) \times (0.8) \times (0.9) = \text{Longwall Tonnage} \quad (\text{Eq. 6})$$

A spread sheet of all calculations is attached and includes the tonnages by location and by lease.











**BLM ASSESSMENT OF REMAINING  
RECOVERABLE RESERVES**

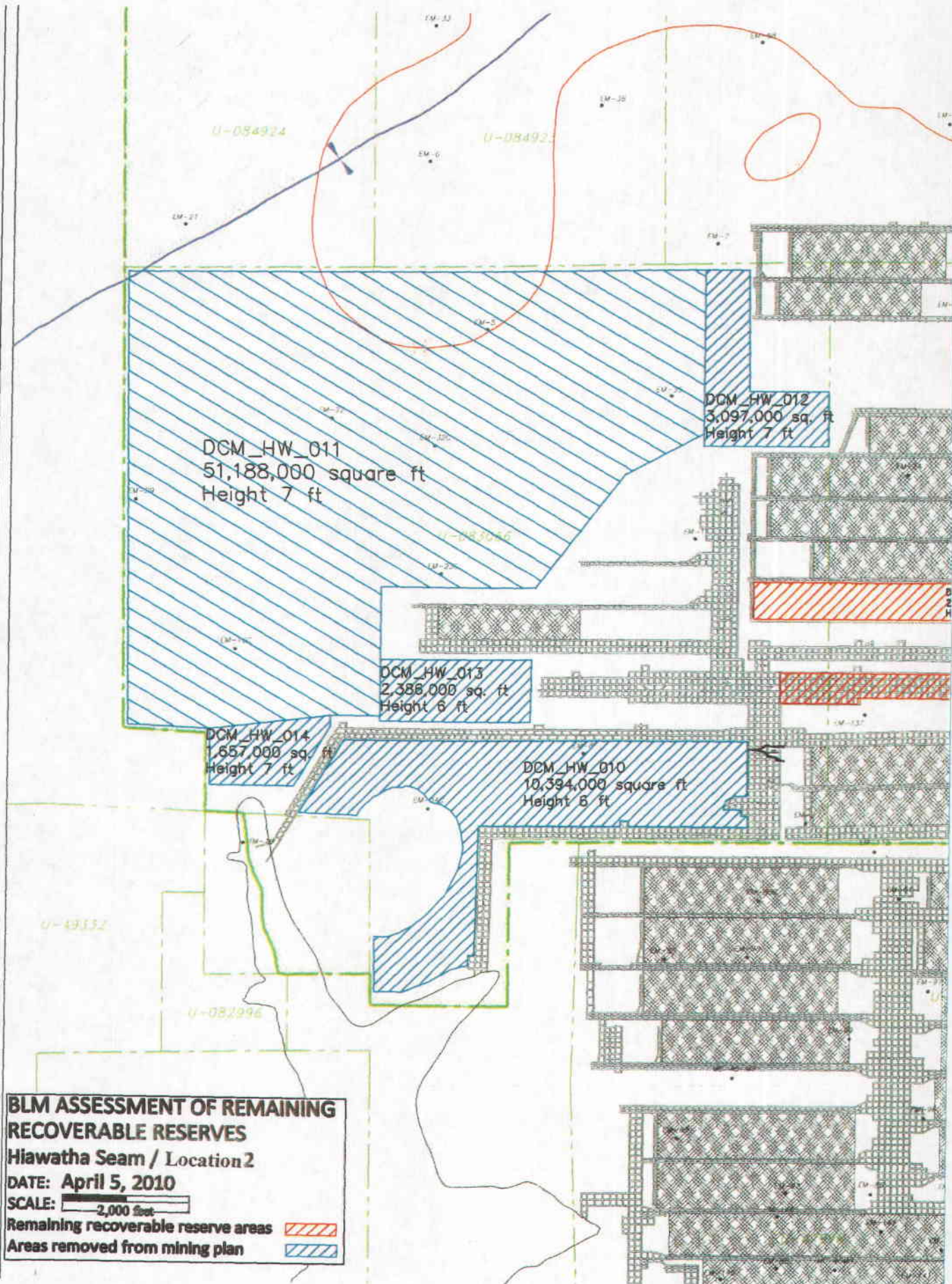
**Hiawatha Seam / Location 2**

**DATE: April 5, 2010**

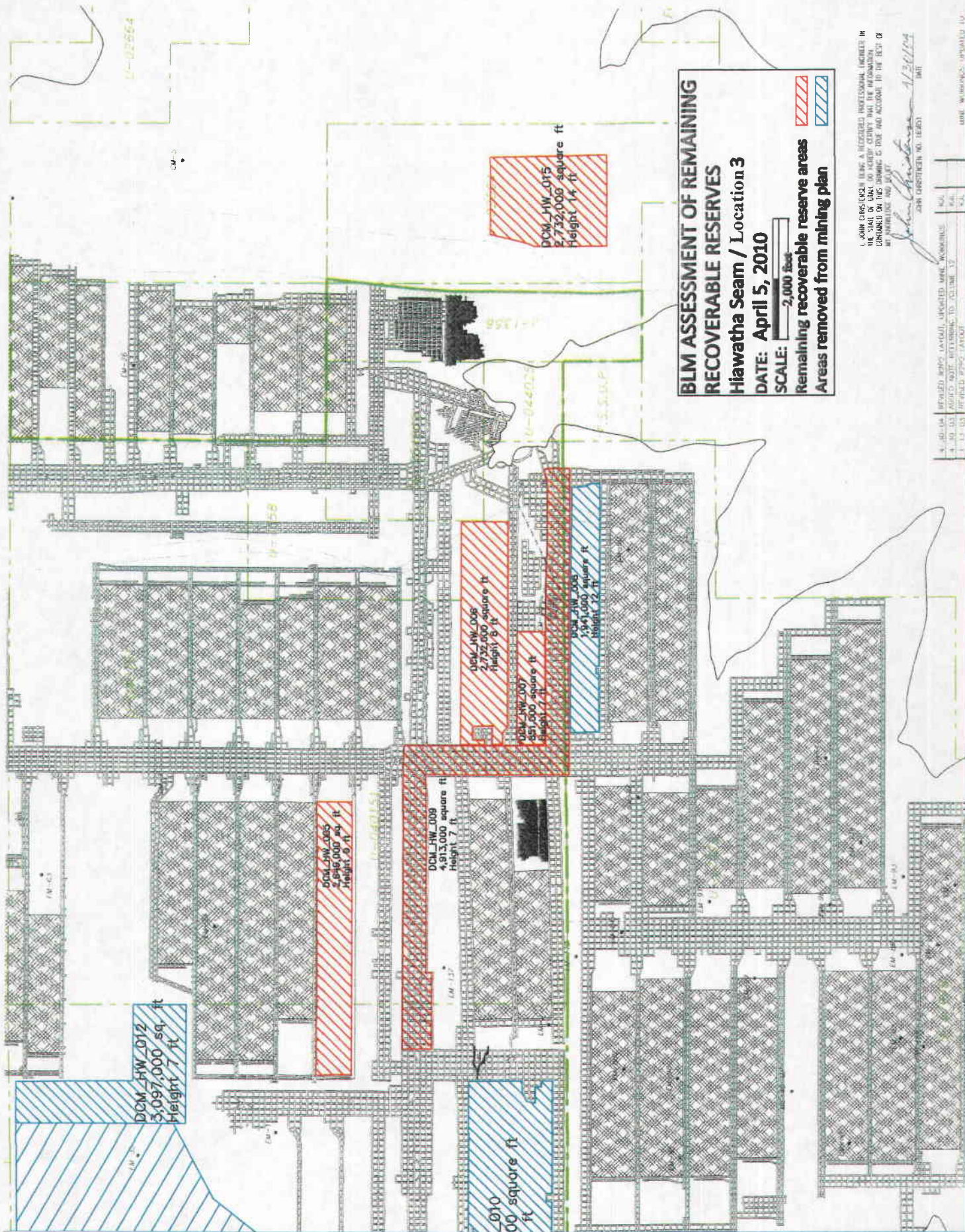
**SCALE: 2,000 feet**

**Remaining recoverable reserve areas**

**Areas removed from mining plan**







**BLM ASSESSMENT OF REMAINING  
RECOVERABLE RESERVES**  
**Hiawatha Seam / Location 3**  
**DATE: April 5, 2010**  
**SCALE: 2,000 feet**  
**Remaining recoverable reserve areas**  
**Areas removed from mining plan**

I, JOHN C. COOK, JR., being a registered professional engineer in the State of Utah, do hereby certify that the information contained on this drawing is true and accurate to the best of my knowledge and belief.

*John C. Cook, Jr.*  
 JOHN COOK, JR. (E-5031)  
 DATE

4. 40-104	REVIEWED BY: [NAME], [TITLE], [COMPANY]	DATE: [DATE]
4. 40-105	APPROVED BY: [NAME], [TITLE], [COMPANY]	DATE: [DATE]
1. 13-103	REVIEWED BY: [NAME], [TITLE], [COMPANY]	DATE: [DATE]

DATE WORKING: [DATE]